

CLAIMS

1. A vibration generator comprising:

a bottom plate having a flat coil substrate installed thereto;

a stationary shaft provided perpendicularly to the bottom plate;

a magnet installed on the stationary shaft with a freely rotatable bearing being disposed between them and opposite to the surface of the flat coil substrate with a slight clearance defined between them;

an unbalancer installed to the magnet; and

a thin magnetic plate,

wherein, for generating a vibration, a current being supplied to a coil on the flat coil substrate to rotate the magnet and unbalancer,

the bottom plate being formed from a nonmagnetic material; and

the thin magnetic plate is installed at the side opposite to the magnet with the bottom plate being placed between the thin magnetic plate and the magnet.

2. The apparatus according to claim 1, wherein the thin magnetic plate utilizes the magnetism of the magnet to attract the magnet toward the flat coil substrate.

3. The apparatus according to claim 1, wherein the thin magnetic plate has such an amount of area that the force of attraction developed between the thin magnetic plate and magnet will not cause an variation in clearance between the magnet and surface of the flat coil substrate even if the magnet and unbalancer are rotated.

4. The apparatus according to claim 1, wherein the thin magnetic plate is removably installed to the bottom plate.
5. An electronic device including a vibration generator, the vibration generator comprising:
 - a bottom plate formed from a nonmagnetic material having a flat coil substrate installed thereto;
 - a stationary shaft provided perpendicularly to the bottom plate;
 - a magnet installed on the stationary shaft with a freely rotatable bearing being disposed between them and opposite to the surface of the flat coil substrate with a slight clearance defined between them;
 - an unbalancer installed to the magnet; and
 - a thin magnetic plate being installed at the side opposite to the magnet with the bottom plate being placed between the thin magnetic plate and magnet.